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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/823,676	03/30/2001	Cai-Zhong Jiang	MBI - 0034	6125

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WILEY, REIN & FIELDING, LLP
ATTN: PATENT ADMINISTRATION
1776 K. STREET N.W.
WASHINGTON, DC 20006

EXAMINER

COLLINS, CYNTHIA E

ART UNIT	PAPER NUMBER
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1638

DATE MAILED: 10/02/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/823,676

Applicant(s)

JIANG, CAI-ZHONG

Examiner

Cynthia Collins

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 7-16 and 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group 1, claims 1-6 and 17, in Paper No. 10, is acknowledged. The traversal is on the ground(s) that SEQ ID NOS: 1-8 are related and share both structural and functional similarities, such that any search based on the structure of any one of these sequences would almost necessarily encompass all of the sequences of the application. Applicant argues that since each of the claims includes a recitation of the same structurally and functionally similar sequences, and since a search encompassing one sequence would likely encompass all of the sequences, a search for additional elements for one group of Invention as compared to another would not be burdensome. Applicant additionally argues that under PTO training materials, groups of claims encompassing both polynucleotides and plants should be joined and examined together (1184 O.G. 86, March 1996). Applicant also argues that because all of the sequences are derived from plant transcription factors, all of the sequences can be searched and examined together. Applicant points to MPEP 803, and asserts that the PTO's own rules for examination indicate that a burden in examining multiple sequences does not exist, and points in particular to MPEP 803.04, which indicates that at least ten different sequences can and should be examined together.

This is not found persuasive because while SEQ ID NOS: 1-8 may be related and may share both structural and functional similarities, each structurally distinct sequence claimed requires a separate search. With respect to the PTO rules regarding search and examination of multiple sequences claimed in a single application, the rules previously gave the Examiner the option of searching and examining up to 10 sequences claimed in a single application. However,

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since 1996, databases and resource allocations at the PTO have changed, and the examination of more than one sequence on the merits in the instant application would present a burden on PTO resources. Regarding the assertion that claims encompassing both polynucleotides and plants should be joined and examined together, it is noted that the invention of Group I encompasses transgenic plants, cells and polynucleotides, and that the plant of Group IX, claim 18, does not require or comprise the polynucleotides of the instant invention. Regarding the assertion that a search for additional elements for one group of Invention as compared to another would not be burdensome, this is not found persuasive because while the search of Group I may overlap with a search of any of Groups II-IX with respect to the polynucleotides of the claimed inventions, their searches are not coextensive of each other, as the Inventions of Groups II-IX each require a search for distinct methods or products. Furthermore, while Applicants assert that they are electing a species within the claims (reply and election page 1), the Examiner maintains that no requirement for an election of species was set forth in the restriction requirement mailed July 5, 2002. That restriction requirement states on page 1 that "restriction to a single nucleic acid sequence and the amino acid sequence it encodes is also required under 35 USC 121". Accordingly, claims 7-16 and 18, and SEQ ID NOS: 3-8, are withdrawn from consideration as being directed to nonelected inventions.

The requirement is still deemed proper and is therefore made FINAL.

Information Disclosure Statement

An initialed and dated copy of Applicant's IDS form 1449, filed March 21, 2002, Paper No. 7, is attached to the instant Office action.

Claim Objections

Claims 1 and 3 are objected to for reciting the sequences of nonelected inventions.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1 and 3 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are drawn to a nucleotide sequence encoding a polypeptide comprising a conservatively substituted variant of a polypeptide of (a), and a nucleotide sequence comprising silent substitutions in a nucleotide sequence of (c).

The specification describes three nucleotide sequences that increase plant biomass or size when overexpressed in a transgenic plant, an isolated nucleic acid of SEQ ID NO:1 an isolated nucleic acid of SEQ ID NO: 4, and an isolated nucleic acid of SEQ ID NO:8 (page 36). The specification does not describe any nucleotide sequence encoding any polypeptide comprising any conservative substitution of SEQ ID NO:2, or any nucleotide sequence comprising any silent substitution of SEQ ID NO:1, nor do the claims recite any function for the polypeptides encoded

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by said substituted sequences. The specification does not provide an adequate description of the claimed genera, and in view of the level of knowledge and skill in the art, one skilled in the art would not recognize from the disclosure that the applicant was in possession of nucleotide sequences encoding conservatively substituted polypeptide variants of SEQ ID NO:2 or silently substituted nucleotide sequences of SEQ ID NO:1 (see Written Description Guidelines, Federal Register, Vol. 66, No. 4, January 5, 2001, pages 1099-1111).

Claims 1-6 and 17 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an isolated polynucleotide of SEQ ID NO: 1 encoding a polypeptide of SEQ ID NO:2 that increases plant biomass when overexpressed in a transgenic *Arabidopsis* plant, and for a transgenic *Arabidopsis* plant comprising a polynucleotide of SEQ ID NO:1 or a polynucleotide encoding SEQ ID NO:2, said plant exhibiting increased expression levels of SEQ ID NO:1 and an increased biomass as compared to a nontransformed *Arabidopsis* plant, does not reasonably provide enablement for other isolated polynucleotides, or for transgenic plants comprising other polynucleotides or exhibiting other phenotypic characteristics as a consequence of altered levels of expression of other polynucleotides. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims are drawn to an isolated or recombinant polynucleotide selected from the group consisting of (a) a nucleotide sequence encoding a polypeptide of SEQ ID NO:2, (b) a nucleotide sequence encoding a conservatively substituted variant of SEQ ID NO:2, (c) a nucleotide sequence of SEQ ID NO:1, (d) a nucleotide sequence comprising silent substitutions

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of SEQ ID NO:1, (e) a nucleotide sequence which hybridizes under stringent conditions to any of (a)-(d), (f) a nucleotide sequence comprising at least 15 consecutive nucleotides of any of (a)-(e), (g) a nucleotide sequence comprising a subsequence or fragment of any of (a)-(f), (h) a nucleotide sequence having at least 40 % sequence identity to of any of (a)-(g), (i) a nucleotide sequence having at least 85 % sequence identity to of any of (a)-(g), (j) a nucleotide sequence encoding a polypeptide having at least 40 % sequence identity to SEQ ID NO:2, (k) a nucleotide sequence encoding a polypeptide having at least 85 % sequence identity to SEQ ID NO:2, and (l) a nucleotide sequence encoding a conserved domain of a polypeptide having at least 65 % sequence identity to a conserved domain of SEQ ID NO:2. The claims are also drawn to transgenic plants comprising said isolated polynucleotides, and to transgenic plants comprising altered expression levels of said isolated polynucleotides.

The specification discloses that overexpression of an isolated nucleic acid of SEQ ID NO:1 encoding a polypeptide of SEQ ID NO:2 in a transgenic *Arabidopsis* plant increases the plants biomass as compared to a nontransformed control plant, as evidenced by an increase, typically at least 150%, in the plant fresh weight, dry weight or seed yield as compared to a nontransformed control plant (page 36). The specification discloses that overexpression of an isolated nucleic acid of SEQ ID NO:1 encoding a polypeptide of SEQ ID NO:2 in a transgenic *Arabidopsis* plant increases the plants biomass as compared to a nontransformed control plant, as evidenced by an increase, typically at least 150%, in the plant fresh weight, dry weight or seed yield as compared to a nontransformed control plant (page 36). The specification also discloses that transgenic plants that overexpress SEQ ID NOS: 4 and 8, which share 89% and 83%

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sequence identity over a conserved domain of SEQ ID NO:2 comprising amino acid residues 33-50, are substantially larger than wild-type plants (page 36).

While one of skill in the art could readily obtain nucleotide sequences encoding a conservatively substituted variant of SEQ ID NO:2 or which hybridize under stringent conditions to any of (a)-(d) or which comprise at least 15 consecutive nucleotides of any of (a)-(e) or which comprise a subsequence or fragment of any of (a)-(f) or which have at least 40 % or at least 85% sequence identity to of any of (a)-(g) or which encode a polypeptide having at least 40 % or at least 85% sequence identity to SEQ ID NO:2 or which encode a conserved domain of a polypeptide having at least 65 % sequence identity to a conserved domain of SEQ ID NO:2, it would require undue experimentation for one skilled in the art to determine which of these nucleotide sequences to express and at what level, because the ability of a nucleic acid sequence to produce a useful effect when expressed in a transgenic plant is unpredictable. Furthermore, if as few as one to as many as all amino acids of SEQ ID NO:2 were conservatively substituted, this would result in a myriad of different proteins, such that the ability of any of these proteins to alter plant biomass would be unpredictable. Additionally, Applicant does not teach a single 15-mer subsequence that can modify a plant's biomass. As SEQ ID NO:1 is 974 nucleotides in length, it would require undue experimentation for one skilled in the art to determine which 15-mers of SEQ ID NO:1 would function to modify a plant's biomass, as the ability of a 15-mer to alter a plants biomass is unpredictable. The specification does not provide sufficient guidance for one skilled in the art to select a sequence from this myriad of sequences that could be used to transform a plant such that the alteration of the expression of the sequence would result in some useful effect, such as an increase in plant biomass. Additionally, given the diversity of the

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sequences claimed, it would require undue experimentation for one skilled in the art to determine which of these nucleotide sequences to express in order to modify plant biomass in a particular manner, as "modify" encompasses both increasing and decreasing plant biomass, and it is unclear whether any of the claimed sequences would function to both increase and decrease plant biomass. The specification does not provide sufficient guidance for one skilled in the art to determine which of these myriad sequences to express and at what level in order to achieve an increase or a decrease in plant biomass, because the specification teaches only three nucleic acid sequences that appear to increase plant biomass when expressed in a transgenic plant.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 3 are indefinite in the recitations of the indefinite article "a" before "polypeptide of (a)", "nucleotide sequence of (c)", "nucleotide sequence of one or more of", and "sequence of any of ". It is suggested that the claim be amended to recite the definite article "the" instead of the indefinite article "a".

Claims 1 and 3 are indefinite in the recitation of "silent substitutions" in part (d). It is unclear what type of substitutions are intended. Is a nucleotide sequence comprising silent substitutions the same as degenerate nucleotide sequence?

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Claims 1 and 3 are indefinite in the recitation of "modifies" in part (g). It is unclear what type of modifications are intended, as a plants biomass may be modified in more than one way.

Claims 1 and 3 are indefinite in the recitation of "complementary nucleotide sequence thereof". It is unclear what type of complementary nucleotide sequence Applicant intends to claim, as a single nucleotide would constitute a complementary nucleotide sequence. It is suggested that the claim be amended to recite "fully" complementary.

Claims 1 and 3 are indefinite in the recitation of "hybridizes under stringent conditions". It is unclear what conditions would yield the claimed nucleic acid molecules, as those skilled in the art define stringent conditions differently. It is suggested that the claims be amended to recite specific hybridization conditions.

Claims 1 and 3 are indefinite in the recitation of "a conserved domain". It is unclear what conserved domain is being referred to, as a polypeptide may comprise multiple conserved domains, and the claims do not recite which amino acids of the SEQ ID NO correspond to the intended conserved domain.

Claim 2 is indefinite in the recitation of "said nucleotide sequence". It is unclear which of the nucleotide sequences of claim 1 said nucleotide sequence refers to.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-6 and 17 are rejected under 35 U.S.C. 101 because the claimed invention is not supported by either a specific asserted utility or a well established utility.

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The claims are drawn to isolated nucleic acid molecules. Although the claims recite that the isolated nucleic acid molecules have structural features in common with the nucleotide sequence of SEQ ID NO:1 or encode polypeptides having structural features in common with the amino acid sequence of SEQ ID NO:2, the claims do not recite any function for the polypeptide encoded by the claimed polynucleotides. Applicant should note that modifying biomass is a result, not a function.

Claims 1-6 and 17 are also rejected under 35 U.S.C. 112, first paragraph. Specifically, since the claimed invention is not supported by either a specific asserted utility or a well established utility for the reasons set forth above, one skilled in the art clearly would not know how to use the claimed invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 3, 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Bevan et. al. (GenBank Accession No. AL022604, 01 April 1999).

The claims are drawn to an isolated or recombinant polynucleotide selected from the group consisting of (a) a nucleotide sequence encoding a polypeptide of SEQ ID NO:2, (b) a nucleotide sequence encoding a conservatively substituted variant of SEQ ID NO:2, (c) a nucleotide sequence of SEQ ID NO:1, (d) a nucleotide sequence comprising silent substitutions

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of SEQ ID NO:1, (e) a nucleotide sequence which hybridizes under stringent conditions to any of (a)-(d), (f) a nucleotide sequence comprising at least 15 consecutive nucleotides of any of (a)-(e), (g) a nucleotide sequence comprising a subsequence or fragment of any of (a)-(f), (h) a nucleotide sequence having at least 40 % sequence identity to any of (a)-(g), (i) a nucleotide sequence having at least 85 % sequence identity to any of (a)-(g), (j) a nucleotide sequence encoding a polypeptide having at least 40 % sequence identity to SEQ ID NO:2, (k) a nucleotide sequence encoding a polypeptide having at least 85 % sequence identity to SEQ ID NO:2, and (l) a nucleotide sequence encoding a conserved domain of a polypeptide having at least 65 % sequence identity to a conserved domain of SEQ ID NO:2. The claims are also drawn to a cloning or expression vector comprising said polynucleotide, and a cell comprising said cloning or expression vector.

Bevan et. al. teach an isolated or recombinant polynucleotide selected from the group consisting of (a) a nucleotide sequence encoding a polypeptide of SEQ ID NO:2, (b) a nucleotide sequence encoding a conservatively substituted variant of SEQ ID NO:2, (d) a nucleotide sequence comprising silent substitutions of SEQ ID NO:1, (e) a nucleotide sequence which hybridizes under stringent conditions to any of (a)-(d), (f) a nucleotide sequence comprising at least 15 consecutive nucleotides of any of (a)-(e), (g) a nucleotide sequence comprising a subsequence or fragment of any of (a)-(f), (h) a nucleotide sequence having at least 40 % sequence identity to any of (a)-(g), (i) a nucleotide sequence having at least 85 % sequence identity to any of (a)-(g), (j) a nucleotide sequence encoding a polypeptide having at least 40 % sequence identity to SEQ ID NO:2, (k) a nucleotide sequence encoding a polypeptide having at least 85 % sequence identity to SEQ ID NO:2, and (l) a nucleotide sequence encoding a

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conserved domain of a polypeptide having at least 65 % sequence identity to a conserved domain of SEQ ID NO:2. Although Bevan et al. do not explicitly teach a cloning or expression vector comprising said polynucleotide, and a cell comprising said cloning or expression vector, the use of a cloning vector and host cell are implicit, given that a cloning vector and host cell would necessarily have been used to isolate the isolated polynucleotide taught by Bevan et al.

Claims 1-6 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhang et al. (The Plant Cell, 1992, Vol. 4, pages 1575-1588, Applicant's IDS).

The claims are drawn to a recombinant polynucleotide, including a polynucleotide that is complementary to a nucleotide sequence, and a polynucleotide that hybridizes under stringent conditions to a nucleotide sequence, and to a transgenic plant vector and cell comprising said recombinant polynucleotide, and to a plant comprising altered levels of said recombinant polynucleotide.

Zhang et al. teach an AKR recombinant polynucleotide and transgenic *Arabidopsis* plants comprising an AKR recombinant polynucleotide operably linked to a CaMV 35S promoter (page 1576 Figure 1, page 1578 Figure 4, page 1580 Figure 5). The transgenic plants taught by Zhang et al. comprise altered levels of the AKR recombinant polynucleotide (page 1582 Table 2). The recombinant polynucleotide and transgenic plants taught by Zhang et al. anticipate the claimed invention because the recombinant polynucleotides of the claimed invention are not limited to polynucleotides that are fully complementary to any nucleotide sequence or polynucleotides that hybridizes under defined stringent conditions to any nucleotide sequence. Accordingly, the claims read on any recombinant polynucleotide and any transgenic plant, as the claims read on a

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polynucleotide as small as two bases a polynucleotide that would hybridize to the claimed sequences under any conditions.

Remarks

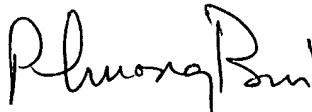
No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Collins whose telephone number is (703) 605-1210. The examiner can normally be reached on Monday-Friday 8:45 AM -5:15 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson can be reached on (703) 306-3218. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-4242 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

CC
October 1, 2002


PHUONG T. BUI
PRIMARY EXAMINER 10/1/02